when much clearer ones of the same objects are already available.—D. S. JOHNSON.

MINOR NOTICES

North American flora.—The third part of Vol. 34 continues the presentation of Carduales by RYDBERG,[3] including the completion of the Tageteae and the Anthemideae. In the Tageteae 22 genera are recognized, the last 5 being presented in this part. Of these the large genera are *Pectis* with 71 species (11 new) and *Porophyllum* with 42 species (10 new). A new genus (*Hydropectis*) is described, based on *Pectis aquatica* Wats.

The recognized genera of Anthemideae number 21, a considerable number of them being segregated from more familiar genera. The largest genus is *Artemisia* with 120 species (29 new), followed by *Achillea* with 24 species (6 new). The other genera are represented by comparatively few species. Three new genera are described as follows: *Vesicarpa*, based on *Artemisia potentilloides* Gray; *Chamartemisia*, based on *Tanacetum compactum* Hall; *Artemisiastrum*, based on *Artemisia Palmeri* Gray.—J. M. C.

The theory of evolution.—SCOTT[4] has made an excellent restatement of the evidences of organic evolution. The somewhat hackneyed subject is enlivened by a forcible and very readable presentation. The book is the result of the organization of 6 lectures (the Westbrook Lectures for 1914). In addition to the evidences from classification, comparative anatomy, embryology, paleontology, and geographical distribution, the author presents evidence derived from domestication, from blood tests, and from experiment.

The opening chapter gives a brief historical review of theories of evolution and a concise statement of the present status of the question. I have seen no better presentation of this body of data for both biologist and general reader than that given in this little book. My only criticism is that it is insufficiently illustrated, although the few illustrations used are well chosen—H. H. NEWMAN.

A moss flora.—GROUT[5] has published a very convenient list of the moss flora of all counties of New York and New Jersey adjacent to New York City. The moss flora of this area has probably been explored more thoroughly than that of any other region of the United States. Numerous keys make the recognition of genera and species relatively easy, and the excellent photographic plates illustrate the genera. Such a publication should stimulate the study of a very interesting flora, for, as the author remarks, "in and around New York

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[3] RYDBERG, PER AXEL, North American Flora **34**:part 3. pp. 181–288. Carduales: Carduaceae (Tageteae, Anthemideae). New York Botanic Garden. 1916.

[4] SCOTT, W. B., The theory of evolution. 8vo. pp. vii+183. New York: Macmillan. 1917.

[5] GROUT, A. J., The moss flora of New York City and vicinity. 8vo. pp. 120. *pls. 12*. New Dorp (N.Y.): published by the author. 1916.

City the moss flora of the north and of the south meet and mingle, and the number of species occurring is large, varied, and interesting."—J. M. C.

NOTES FOR STUDENTS

Transpiration studies.—Among several recent papers dealing with various phases of the study of transpiration, a prominent place should be given to one by LIVINGSTON and SHREVE[6] upon improvements in the use of the cobalt chloride paper method. An improved paper slip has been designed which combines two permanent color standards and an area of carefully prepared cobalt chloride paper. The determinations of the end points are made more definite, therefore, and the probability of error is much reduced. An improved device for furnishing a standard water surface is described also. The temperature relations of the rate of color change in the hygrometric paper and its permanent standardization is discussed also. These improvements will greatly advance the method of study which has already been proved valuable.

Another modification of methods of study is seen in DARWIN'S[7] investigation of the relation of transpiration to relative humidity by the porometer method, using *Prunus Laurocerasus* and eliminating the action of stomata by applying vaseline to the lower surface of the leaves and then placing their intercellular spaces in communication with the external air by means of incisions. Plotting the results, he found that transpiration varies directly as relative humidity when a correction is made for the fact that the transpiration rate is not zero in saturated air. The fact that transpiration does occur in saturated air is due, as pointed out by SACHS, to the production of heat in the leaf by respiration. The experiments showed that for the transpiration to be entirely checked a humidity of 5 per cent above saturation would be necessary, and hence the temperature of the leaf due to respiration is, under the conditions of the experiments, 0°.8C. above that of the atmosphere.

Using similar methods and materials, DARWIN[8] also studied the effect of diffuse light upon transpiration. The results show so remarkable an amount of variation that it seems dangerous to draw any conclusions other than that light tends to increase the water loss for some unknown reason when its influence upon the action of stomata has been eliminated. This increase averages about 33 per cent.

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[6] LIVINGSTON, B. E., and SHREVE, EDITH B., Improvements in the method for determining the transpiring power of plant surfaces by hygrometric paper. Plant World **19**:257–309. 1916.

[7] DARWIN, F., On a method of studying transpiration. Proc. Roy. Soc. London B **87**:269–280. 1914.

[8] ———, The effect of light on the transpiration of leaves. Proc. Roy. Soc. London B **87**:281–299. 1914.